

UAS Architecture for Distributed Sensing Operations, Phase I

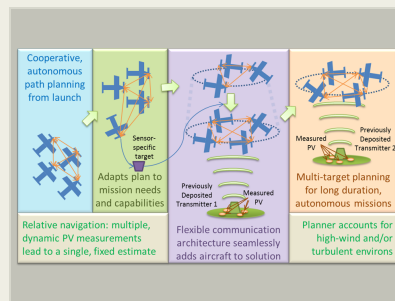
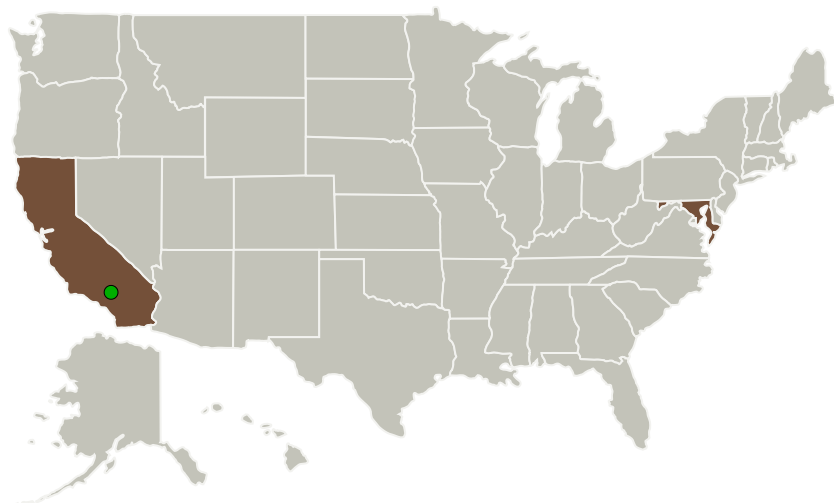
Completed Technology Project (2013 - 2013)



Project Introduction

NASA seeks Unmanned Aircraft Systems (UASs) for Earth science data collection for missions with variable durations, operating proximities, altitudes, and environmental conditions. Of particular interest is the Ice Bridge mission, which takes observations in support of Arctic and Antarctic research by identifying ice sheet motion, three-dimensional ice features, and other atmospheric and surface effects. These UAS aircraft may be equipped with a variety of sensors, with each aircraft potentially completing a unique set of objectives, only some of which take advantage of or require distributed sensing. Such a flexible system demands that vehicles be capable of seamless entry and exit of aircraft from any distributed sensing task. The approach proposed here satisfies these needs through a distributed sensing architecture that allows cluster sensor information to interface with and influence a multi-aircraft, high-precision, closed-loop path planning and control system. In addition, the UAS path planner is capable of managing dynamic flight regimes, including high winds and turbulence, while ensuring proper target tracking. This combination of features maximizes mission utility and path repeatability.

Primary U.S. Work Locations and Key Partners



UAS Architecture for Distributed Sensing Operations

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	3
Technology Areas	3
Target Destinations	3

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Completed Technology Project (2013 - 2013)



Organizations Performing Work	Role	Type	Location
Emergent Space Technologies, Inc.	Lead Organization	Industry	Greenbelt, Maryland
● Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

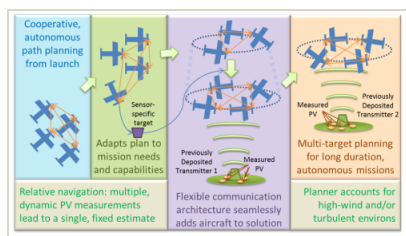
Primary U.S. Work Locations	
California	Maryland

Project Transitions

**May 2013:** Project Start**November 2013:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138550>)

Images

**Project Image**

UAS Architecture for Distributed Sensing Operations

(<https://techport.nasa.gov/image/126848>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Emergent Space Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Darren Zanon

Co-Investigator:

Darren J Zanon

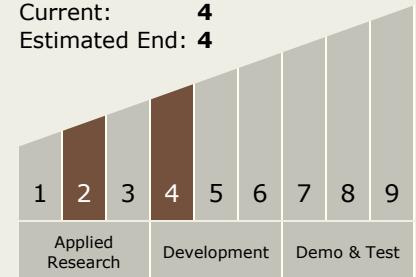
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Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System